



# Building Data Driven Reports for Eclipse-based Applications

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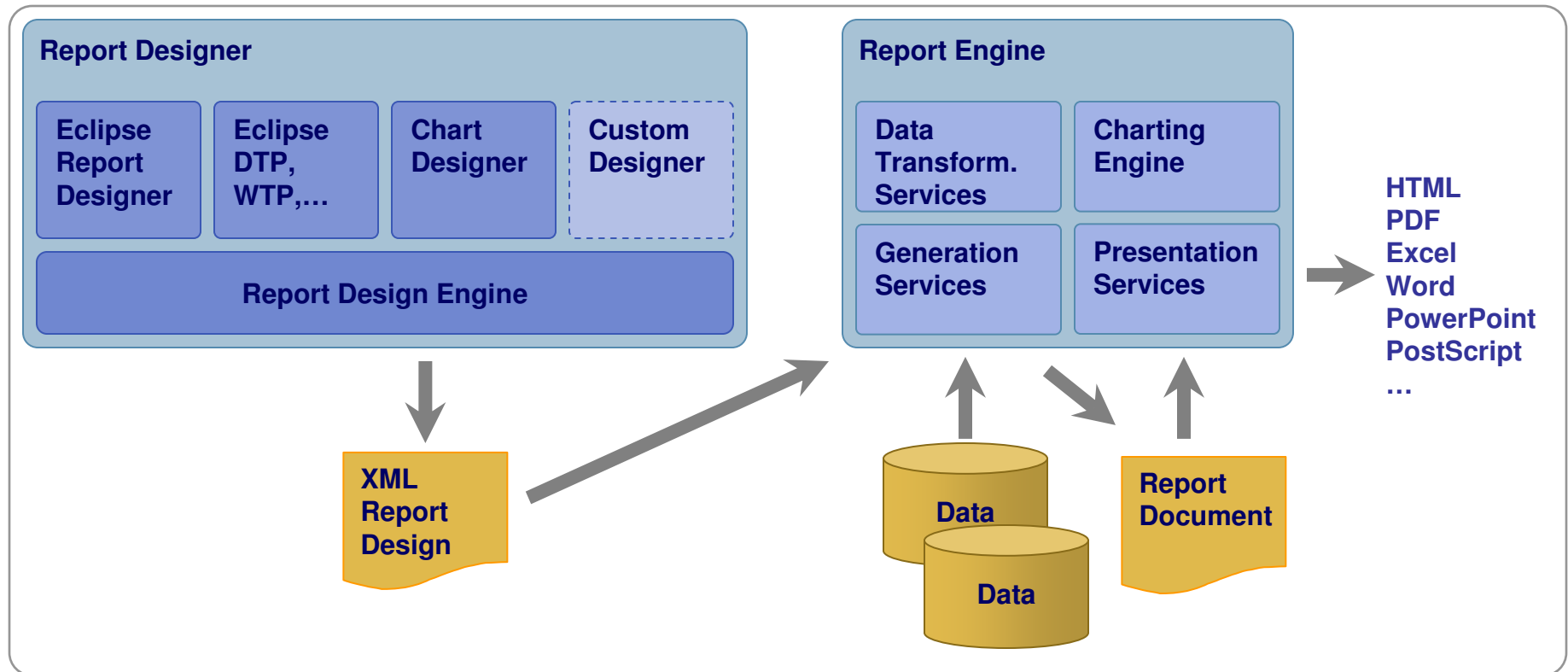


# Agenda

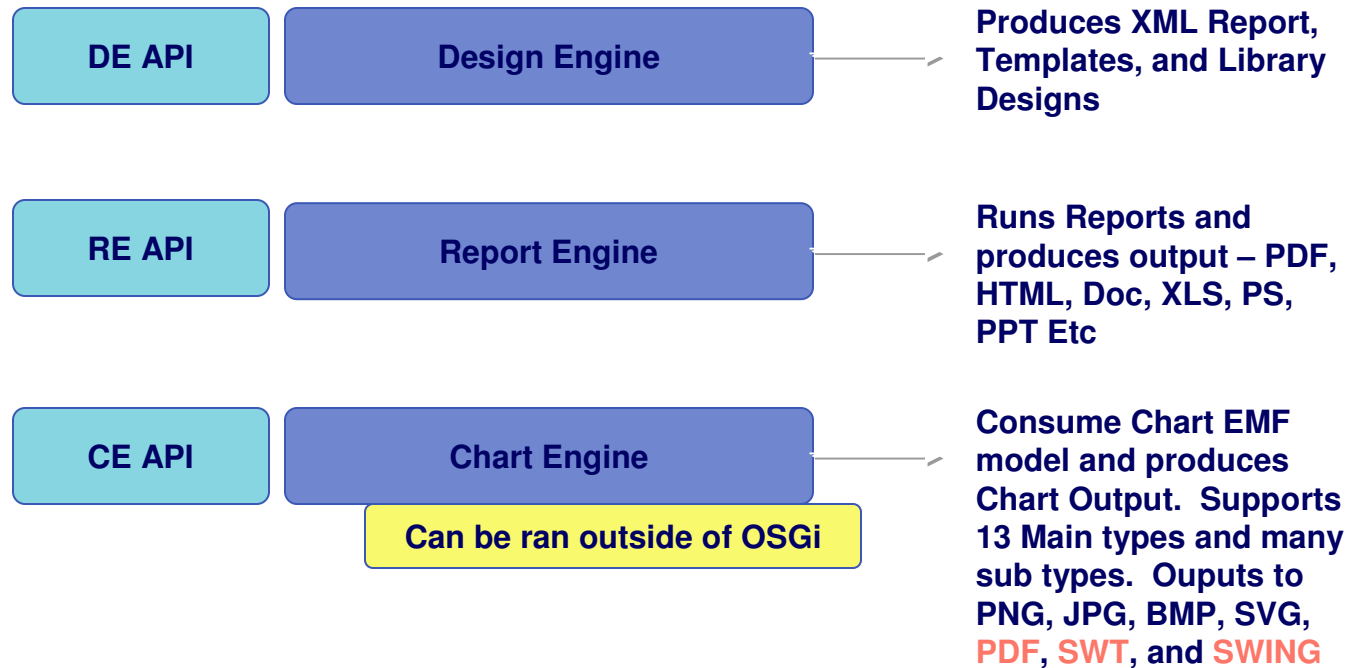


- BIRT Architecture
- Retrieving Data
- Deploying BIRT in an RCP Applications
- Link to eclipse live ppt <http://live.eclipse.org/node/484> for details on new BIRT 2.3 Features

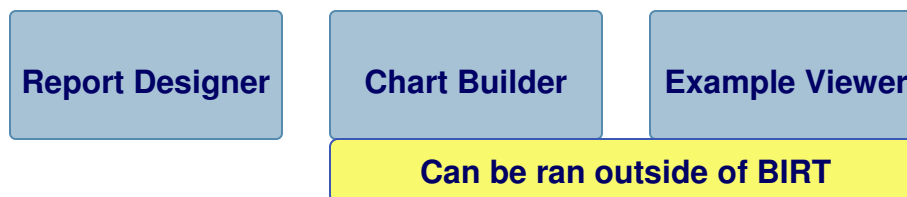
# High Level BIRT Architecture



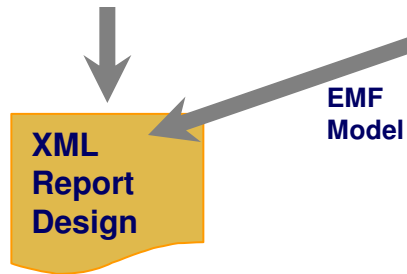
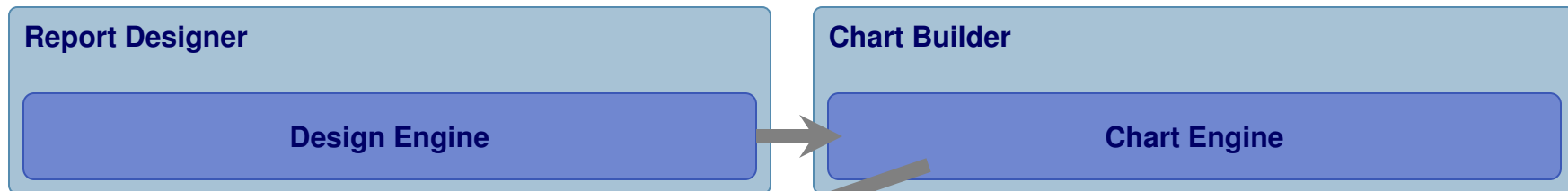
# High Level BIRT Architecture



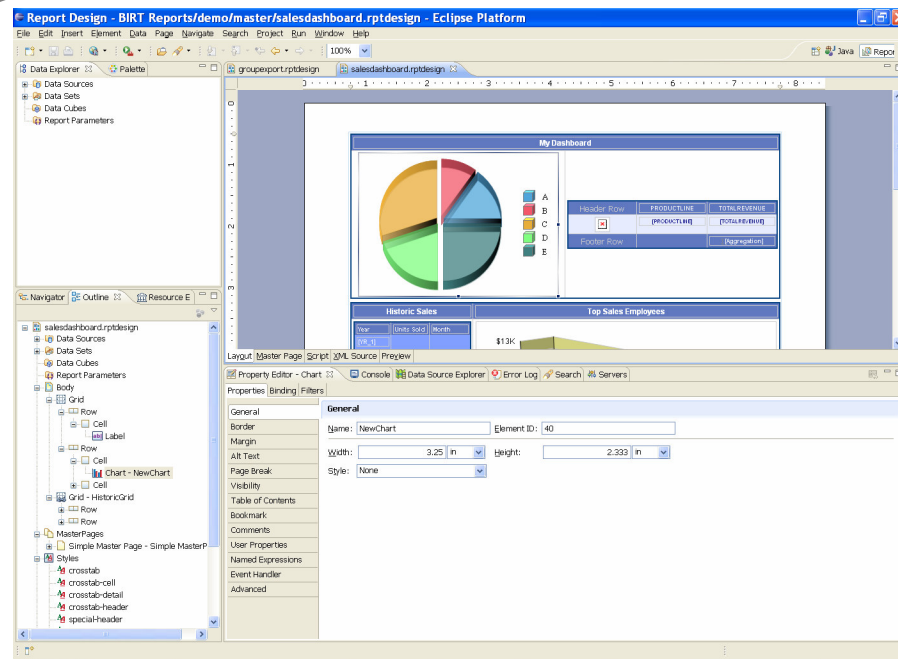
## Core BIRT Open Source Products



# Report Designer – Not covered in Detail



```
groupexport.rptdesign salesdashboard.rptdesign
1<?xml version="1.0" encoding="UTF-8"?>
2<report xmlns="http://www.eclipse.org/birt/2006/design" version="3.2.17" id="1">
3  <property name="CreatedBy">Eclipse BIRT Designer Version 2.3.1.v20080911 Build [lt;2.3.1.v20080922-1151-
4  <property name="units">in</property>
5  <html-property name="description">Use this template for all Classic Model Reports</html-property>
6  <text-property name="displayName">Classic Models Inc Master</text-property>
7  <property name="badLayoutOrientation">ltr</property>
8  <list-property name="libraries">
9    <structure>
10     <property name="fileName">Birt23.rptlibrary</property>
11     <property name="namespace">Birt23</property>
12   </structure>
13 </list-property>
14 <data-sources>
15   <oda-data-source extensionID="org.eclipse.birt.report.data.oda.jdbc" name="Data Source" id="0">
16     <text-property name="displayName"></text-property>
17     <property name="oda2ziVezClass">org.eclipse.birt.report.data.oda.sampledb.Driver</property>
18     <property name="odaURL">jdbc:classicmodel:sampledb</property>
19     <property name="odaUser">ClassicModel</property>
20     <property name="odaConnProfileName"></property>
21   </oda-data-source>
22 </data-sources>
```



# BIRT1.0 Features



## Open Source BIRT Report 1.0 New Features

- |   |   |   |
|---|---|---|
| <ul style="list-style-type: none"><li>▪ Listing and Grouped Listing Reports</li><li>▪ Multi-section Reports</li><li>▪ Sub-reports</li><li>▪ List (including groupings, subtotals)</li><li>▪ Table (including groupings, subtotals)</li><li>▪ Text</li><li>▪ Grid</li><li>▪ Chart</li><li>▪ Label Element</li><li>▪ Data Element</li><li>▪ Image Element</li><li>▪ Web Style Output</li><li>▪ Web-based Report Viewer</li><li>▪ PDF Output</li></ul> | <ul style="list-style-type: none"><li>▪ Printing</li><li>▪ Cut, Copy, and Paste</li><li>▪ Report Wizard (&gt; Cheat Sheets)</li><li>▪ Schematic Design View</li><li>▪ Outline View</li><li>▪ Report Preview</li><li>▪ Style Builder</li><li>▪ Chart Wizard (&gt; Chart Properties)</li><li>▪ Palette View</li><li>▪ Page Setup User Interface</li><li>▪ Grouping User Interface</li><li>▪ Properties User Interface</li><li>▪ Query Editor</li><li>▪ Expression Builder</li></ul> | <ul style="list-style-type: none"><li>▪ Basic Parameters</li><li>▪ Scripting</li><li>▪ Aggregations</li><li>▪ Computed Columns</li><li>▪ Filtering</li><li>▪ Sorting</li><li>▪ Grouping</li><li>▪ JDBC Queries</li><li>▪ Custom Data Access</li><li>▪ Multiple Data Sources and Queries</li><li>▪ Report Execution and Viewing API</li><li>▪ Extensible Model</li><li>▪ Report Design API and Format</li><li>▪ Internationalization</li></ul> |
|---|---|---|

# BIRT 2.0, 2.1 Features



## Open Source BIRT Report 2.0 New Features

- |   |   |  |
|---|---|--|
| <ul style="list-style-type: none"><li>▪ Table of Contents Support in Viewer UI</li><li>▪ Chart Interactivity at View Time in Reports</li><li>▪ Ability to Export Report Data as CSV</li><li>▪ Data Extraction from a Report</li><li>▪ Table of Contents API Support in Engine</li><li>▪ Top N / Bottom N Report Layout</li><li>▪ Multi-pass Aggregate, Sorting and Filtering Support</li><li>▪ Hyperlinks to Other Reports</li><li>▪ Multi-page Reports</li><li>▪ Persistent Storage of Report Output</li><li>▪ Basic XML as a Data Source</li><li>▪ Improvements to Chart components</li><li>▪ Provide Methods for Controlling Chart Behavior</li><li>▪ Provide support for Displaying CLOB (Text) Data from Database</li><li>▪ Provide support for Displaying BLOB (Image) Data from Database</li><li>▪ Bookmarks (Hyperlinks into a Report Body)</li></ul> | <ul style="list-style-type: none"><li>▪ Expanded JavaScript Support</li><li>▪ New and improved chart types</li><li>▪ Controlled/bounded use of System Memory</li><li>▪ Disk-Based Sorting and Data Manipulation</li><li>▪ Page-on-Demand Report Viewing APIs</li><li>▪ Cache Query Results while Developing</li><li>▪ Page-on-Demand Navigation UI/UI Framework</li><li>▪ Concurrent User Scalability for large numbers of Active Users</li><li>▪ Improve PDF Output Generation</li><li>▪ Dynamic Parameter List Support</li><li>▪ Cascading Dynamic Parameter Lists</li><li>▪ Chart Builder/Wizard</li><li>▪ Ability to use Property Editor for Chart Elements</li><li>▪ New Expression Builder for Improved Usability</li><li>▪ Syntax color coding in Expression Builder</li><li>▪ Auto-complete in Expression Builder</li></ul> | <ul style="list-style-type: none"><li>▪ Custom Template Support for New Reports</li><li>▪ Enhance Report Object Model API for Ease of Use</li><li>▪ Improvements to Chart Engine API</li><li>▪ Improve and Publish Chart Model</li><li>▪ Library Support for Reusable Report Items and Objects</li><li>▪ External Style Sheets for Use Across Multiple Report Designs</li><li>▪ Perspective for Java Code Editing in Report Designs</li><li>▪ Ability to import CSS Style Sheets</li><li>▪ Pass-through of External Context Objects to ODA Data Providers</li><li>▪ Support Data Set Output Parameters</li><li>▪ Move ODA Runtime Extension Point and Java Interfaces to DTP</li><li>▪ Provide Plug-in Adapter for BIRT ODA Drivers to DTP ODA</li></ul> |
|---|---|--|

## Open Source BIRT Report 2.1 New Features

- |   |  |  |
|---|--|--|
| <ul style="list-style-type: none"><li>▪ Enhanced chart interactivity and scripting</li><li>▪ New chart marker, scale and legend control</li><li>▪ Additional Y-axis support in charts</li><li>▪ Percentage Pie chart type</li><li>▪ Central location for resource files</li></ul> | <ul style="list-style-type: none"><li>▪ Hyperlinks to Table of Contents entries</li><li>▪ Automatic parameter discovery for hyperlink</li><li>▪ Connection pooling for JDBC data sources</li><li>▪ Multiple Master page support</li><li>▪ Improved usability in parameter management</li></ul> | <ul style="list-style-type: none"><li>▪ Cascading parameters with multiple sources</li><li>▪ Ability to JOIN datasets in BIRT</li><li>▪ Advanced control on data bindings</li><li>▪ More page break and heading control</li><li>▪ Connection profile support</li></ul> |
|---|--|--|

# BIRT 2.2 Features



## Open Source BIRT Report 2.2 New Features

- |   |  |   |
|---|--|---|
| <ul style="list-style-type: none"><li>▪ Dynamic Crosstab Support</li><li>▪ New Aggregation Builder</li><li>▪ Layout Preference</li><li>▪ Link to External CSS files</li><li>▪ Ability to use Styles in highlight rules</li><li>▪ Style support for Table of Contents</li><li>▪ Report Parameter Changes</li><li>▪ Property Editor Enhancements</li><li>▪ New Advanced Properties</li><li>▪ XML Source Editor Enhancements</li></ul> | <ul style="list-style-type: none"><li>▪ New Chart Types</li><li>▪ Improvements to Existing Charts</li><li>▪ New simple chart API</li><li>▪ XLS Emitter</li><li>▪ Word Emitter</li><li>▪ PPT Emitter</li><li>▪ Postscript Emitter</li><li>▪ Web Service ODA</li><li>▪ Flat File Data Source Updates</li></ul> | <ul style="list-style-type: none"><li>▪ Joint Data Set Improvement</li><li>▪ Dynamic Connection Profiles</li><li>▪ Application Context access</li><li>▪ BIRT Web Project Wizard</li><li>▪ BIRT Tag Library</li><li>▪ BIRT Chart Deployment</li><li>▪ ODA Project Wizards</li><li>▪ Report Examples View</li><li>▪ New Chart Examples View</li></ul> |
|---|--|---|



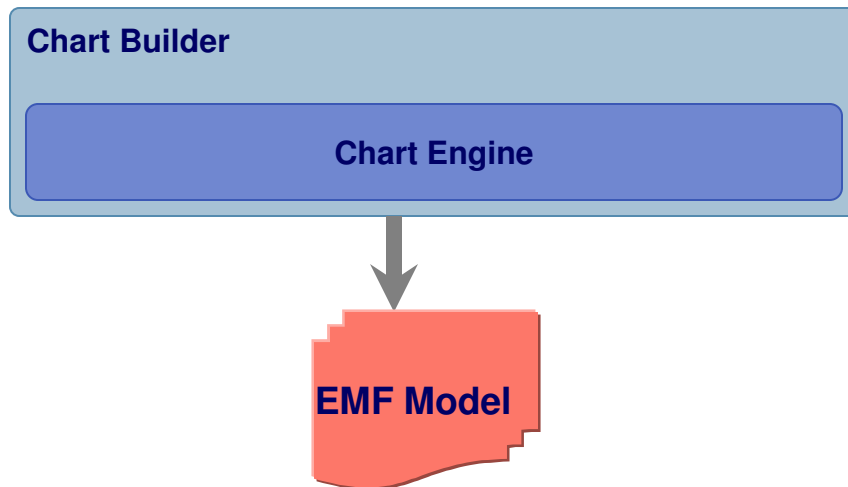
# BIRT 2.3 Features



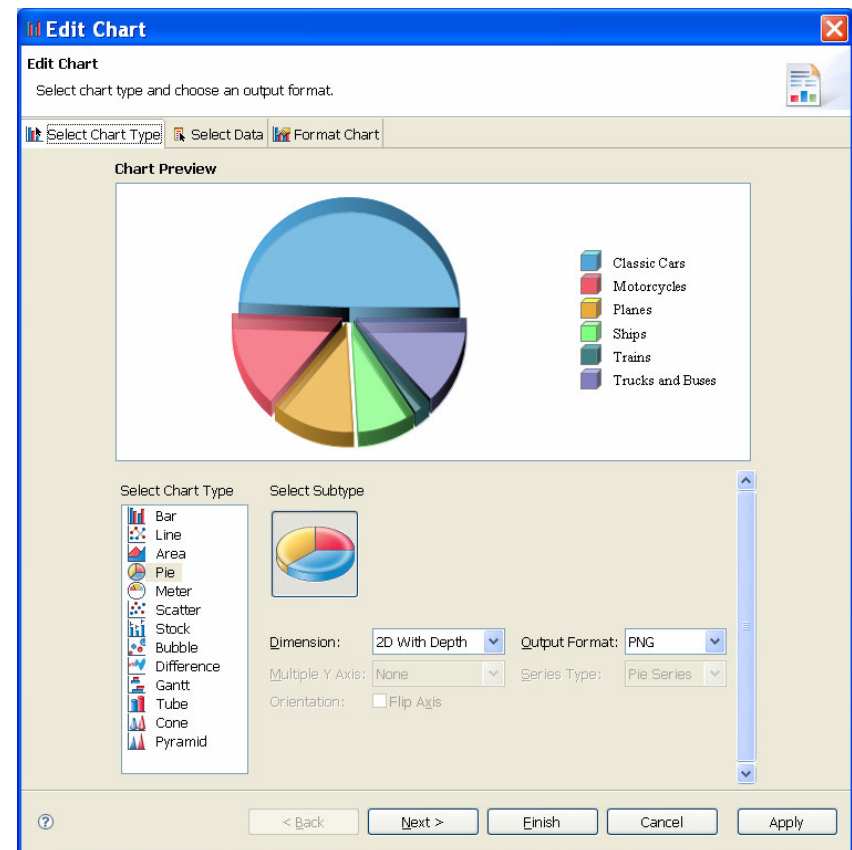
## Open Source BIRT Report 2.3 New Features

- |   |  |   |
|---|--|---|
| <ul style="list-style-type: none"><li>▪ JavaScript/Java Debugger</li><li>▪ Improved JavaScript Editor</li><li>▪ JavaScript/Expression Validation</li><li>▪ BIDI Support</li><li>▪ Crosstab support for displaying measure/total values using charts ( Horizontal or Vertical)</li><li>▪ Improved Crosstab Filtering</li><li>▪ Crosstab Head element support</li><li>▪ Crosstab Scripting Events</li><li>▪ Support for displaying empty rows and columns</li><li>▪ Prototype SQL Query Builder</li><li>▪ Copy/Paste Formatting</li></ul> | <ul style="list-style-type: none"><li>▪ Crosstab support for setting default empty cell values</li><li>▪ Crosstab support for derived measures</li><li>▪ New Multi-View report item support</li><li>▪ Improved Chart Engine ( Marker Scripts, Pie Rotation, Cube Support, Better Sorting and Grouping Support)</li><li>▪ Add JavaScript Button</li><li>▪ External CSS link at View Time</li><li>▪ Horizontal Page Break for tables and crosstabs</li><li>▪ Export report item to library</li><li>▪ New Resource View</li><li>▪ Multi Result Set Stored Procedure Support</li><li>▪ Border Styles – Groove, Ridge, Inset, and Outset)</li></ul> | <ul style="list-style-type: none"><li>▪ Project Specific Settings</li><li>▪ Connection Profile Wizard</li><li>▪ Preview Extension Point</li><li>▪ Reduced size of PDF and Postscript outputs</li><li>▪ "OdaJDBCDriverClassPath" Application Context setting to set the classpath to JDBC drivers</li><li>▪ Generate RptDocument from Designer</li><li>▪ New Data Extraction extension point</li><li>▪ New Connection Profile wizard in the BIRT Data Source Wizard</li><li>▪ Rectangle Select</li><li>▪ Improved GUI look and feel</li><li>▪ Concatenate Aggregate Function</li></ul> |
|---|--|---|

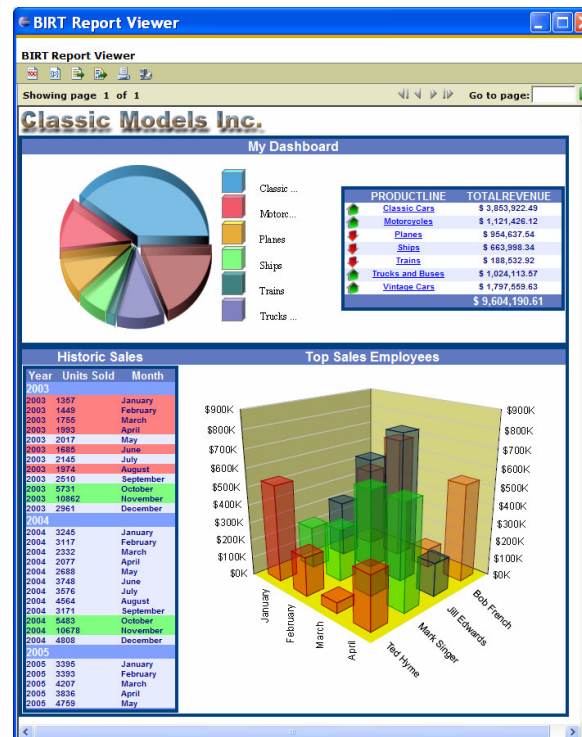
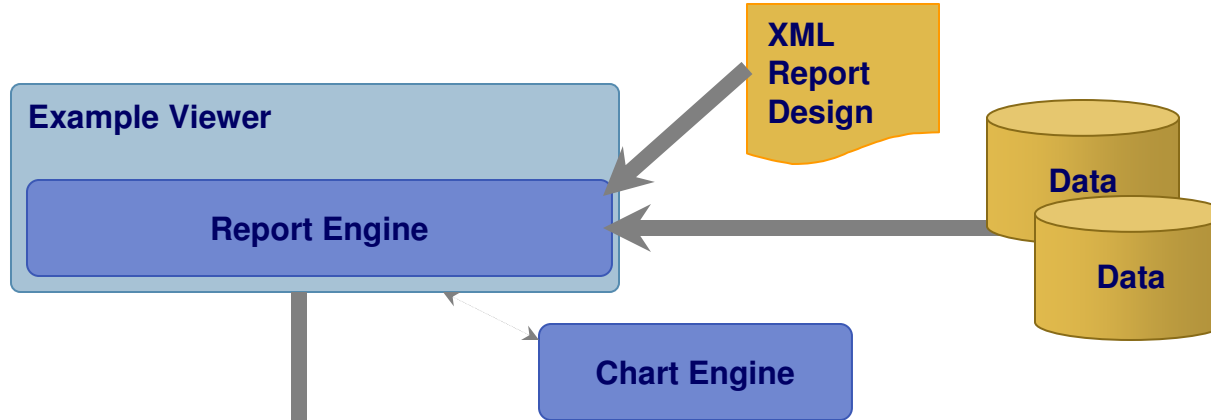
# Chart Builder



- Can be ran inside and outside of BIRT
- 13 Main types, many sub types
- Support interactivity eg drill through on bar
- Extensible



# Example Web Viewer



- Available as a J2EE component
- Available as an Eclipse Plugin
- Localized in Many Languages
- TOC, Paginated HTML, Export data and to different formats
- Optional rptdocument to run once and render many times
- Also supplies Tag libraries for JSP integration
- WTP Wizard to deploy to app server



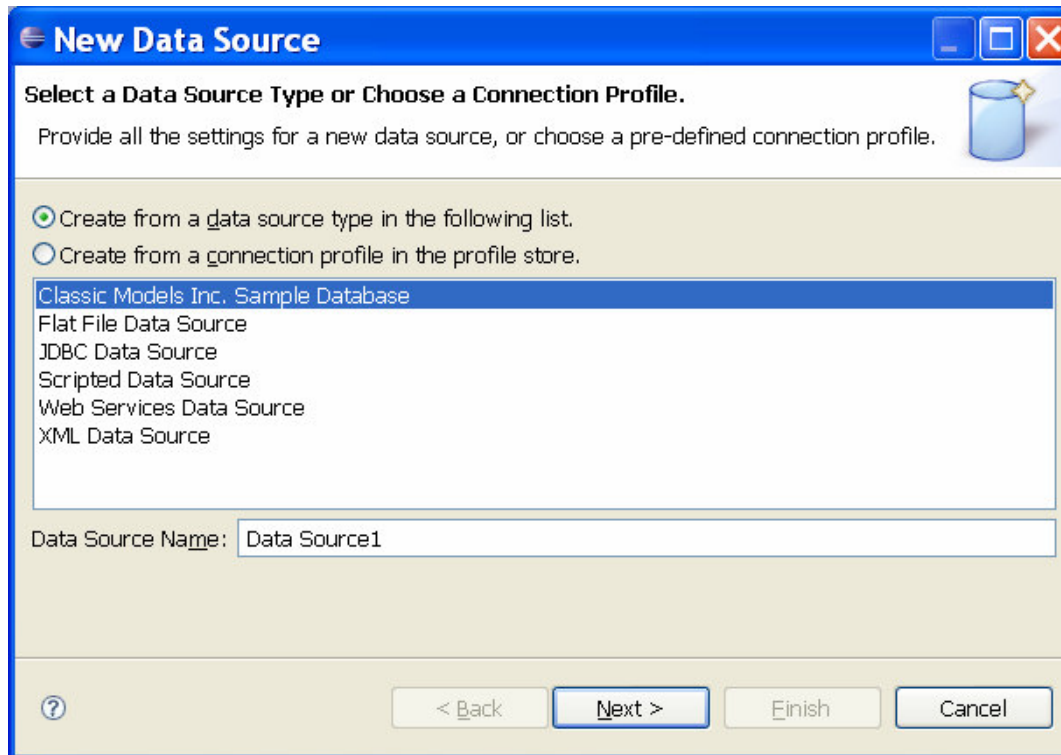
## Designer Quick Demo





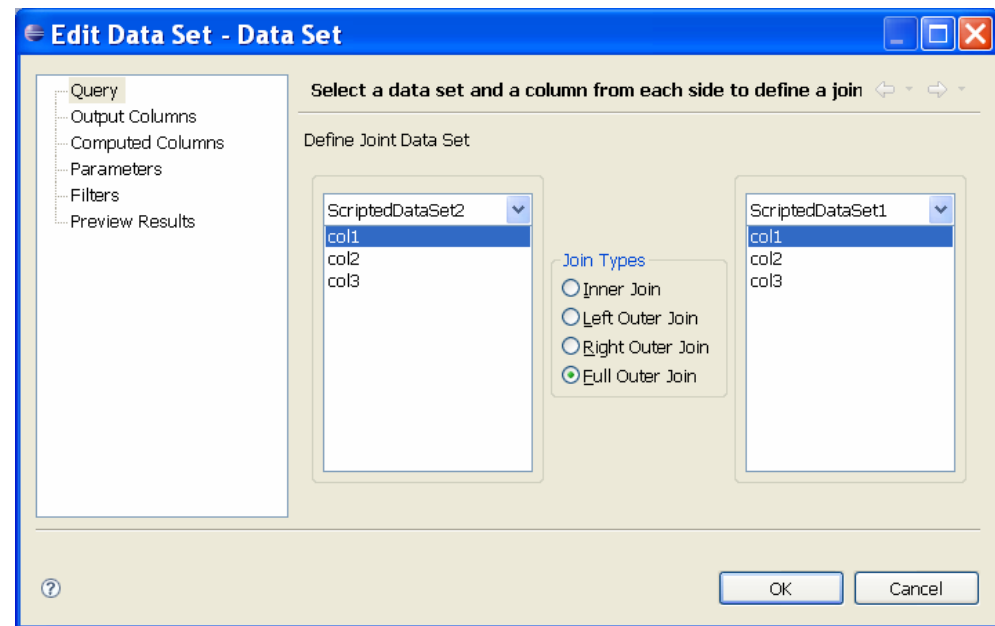
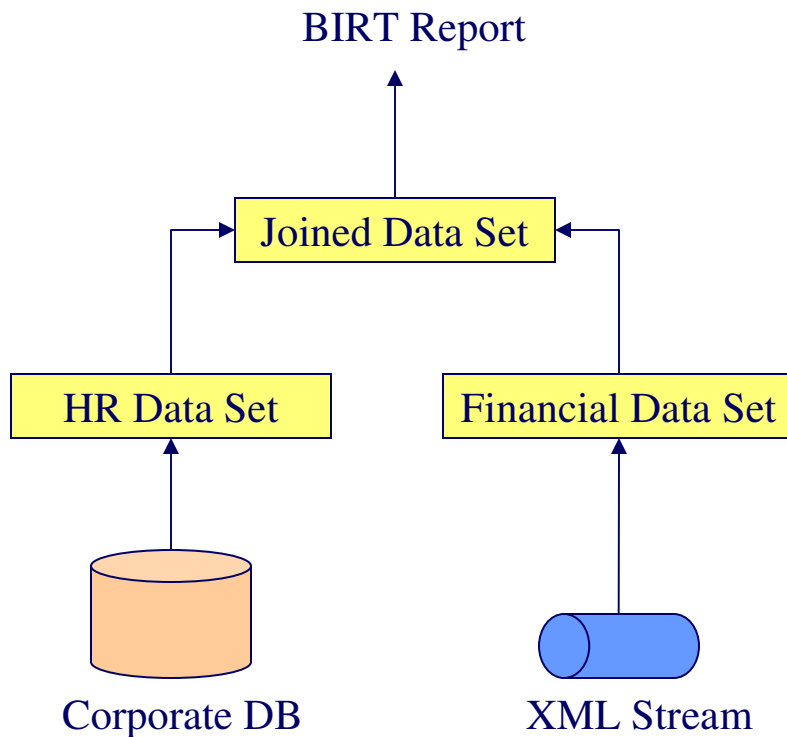
## How Does BIRT Get Data

# BIRT – Retrieving Data

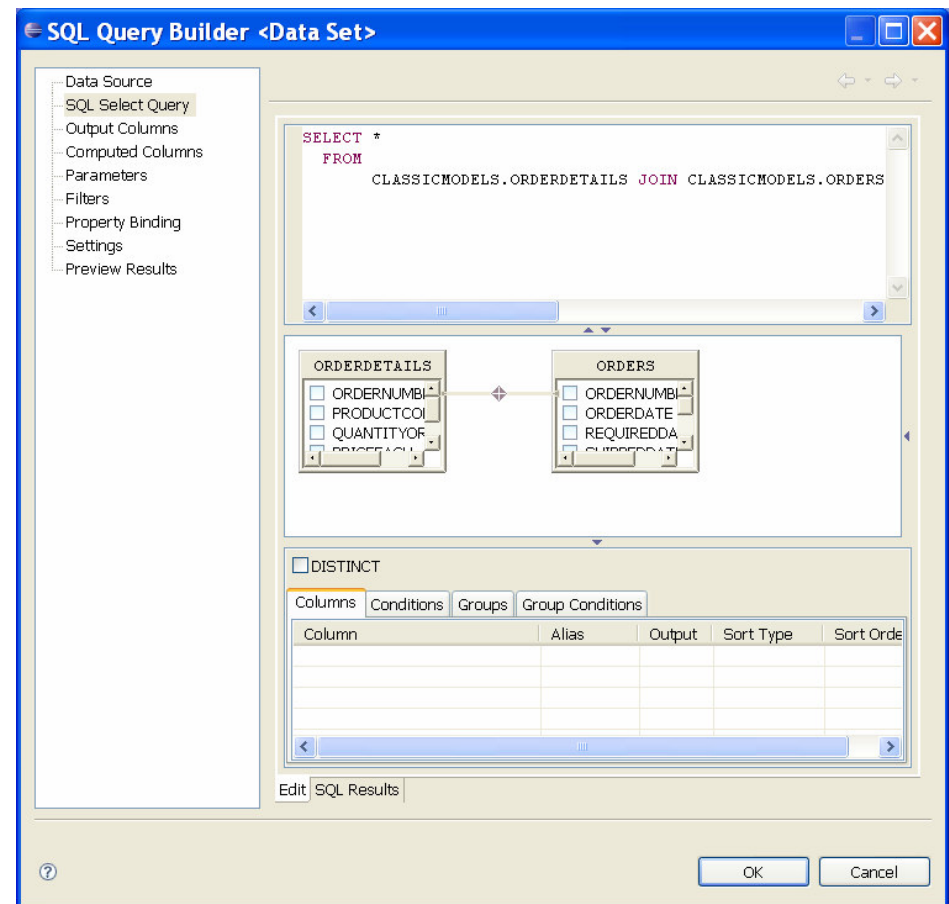
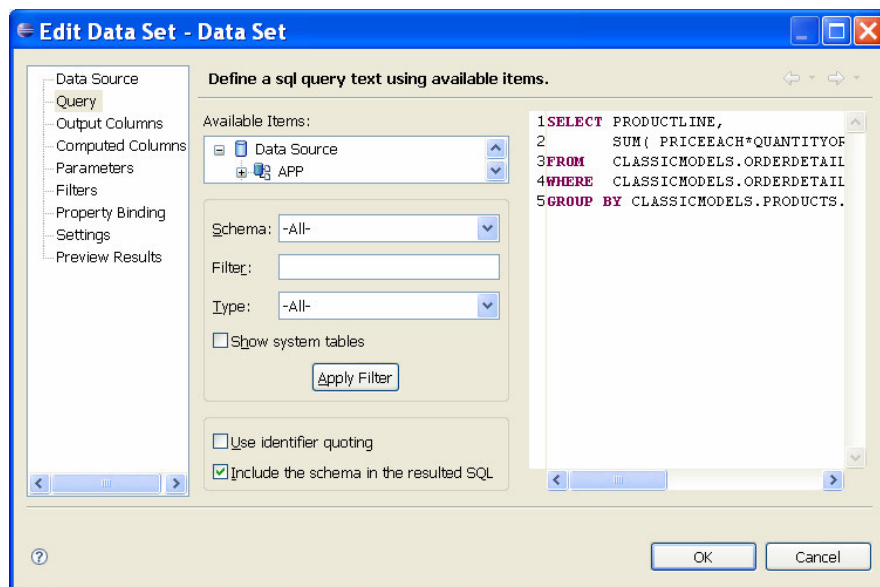


- BUILT on top of DTP ODA
- Supports Connection Profiles
- Property Binding
- Scripting
- Joint Data Sets
- Extensible
- BIRT can also retrieve data from Session variables

# BIRT – Retrieving Data – Joint Data Set

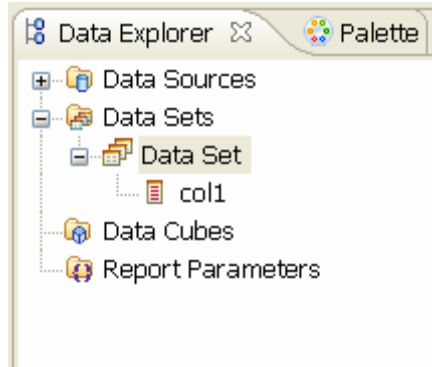


# BIRT – Retrieving Data – New Prototype SQLQB





# BIRT – Retrieving Data – Scripted Data Set



Script: open

```
1 importPackage( Packages.my.test.obj );
2
3 so = new ScriptedObj();
4 hm = so.getHM();
5 iter = hm.entrySet().iterator();
```

Script: fetch

```
1 if( iter.hasNext() ){
2 var en = iter.next();
3 try{
4 row["col1"] = en.getValue();
5 }catch(e) {
6 row["col1"] = "error";
7 }finally {
8 row["col1"] = "finally";
9 }
10 return true;
11 }else{
12 return false;
13 }
```

- No UI
- One Offs
- Access session or request variables
- Access you custom classes

# BIRT – Retrieving Data – ODA Framework



- Reusable
- Wizard project to create example runtime and design time plugins
  
- ODA articles – on BIRT Exchange
- <http://www.birt-exchange.com/devshare/designing-birt-reports/445-oda-primer-articles/>

# BIRT – Retrieving Data – ODA Framework



- ODA is usually created using two or more plug-ins. One for runtime and one for design time.
- ODA Runtime Extension Points
  - **org.eclipse.datatools.connectivity.oda.dataSource** – Used to create connections and query data from a data source.
- ODA Design Time Extension Points
  - **org.eclipse.datatools.connectivity.connectionProfile** – Used to create shareable connection profiles.
  - **org.eclipse.datatools.connectivity.ui.connectionProfileImage** – Used to set image for connection profile.
  - **org.eclipse.ui.propertyPages** - Used to present and store common properties for your ODA. Eg, config file location, db name, etc.
  - **org.eclipse.datatools.connectivity.oda.design.ui.dataSource** – Used to create the GUI for your data source and data sets.



ODA Demo





org.eclipse.datatools.connectivity.oda.dataSource

dataSource

dataSet

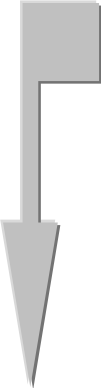
driverClass attribute

properties

properties

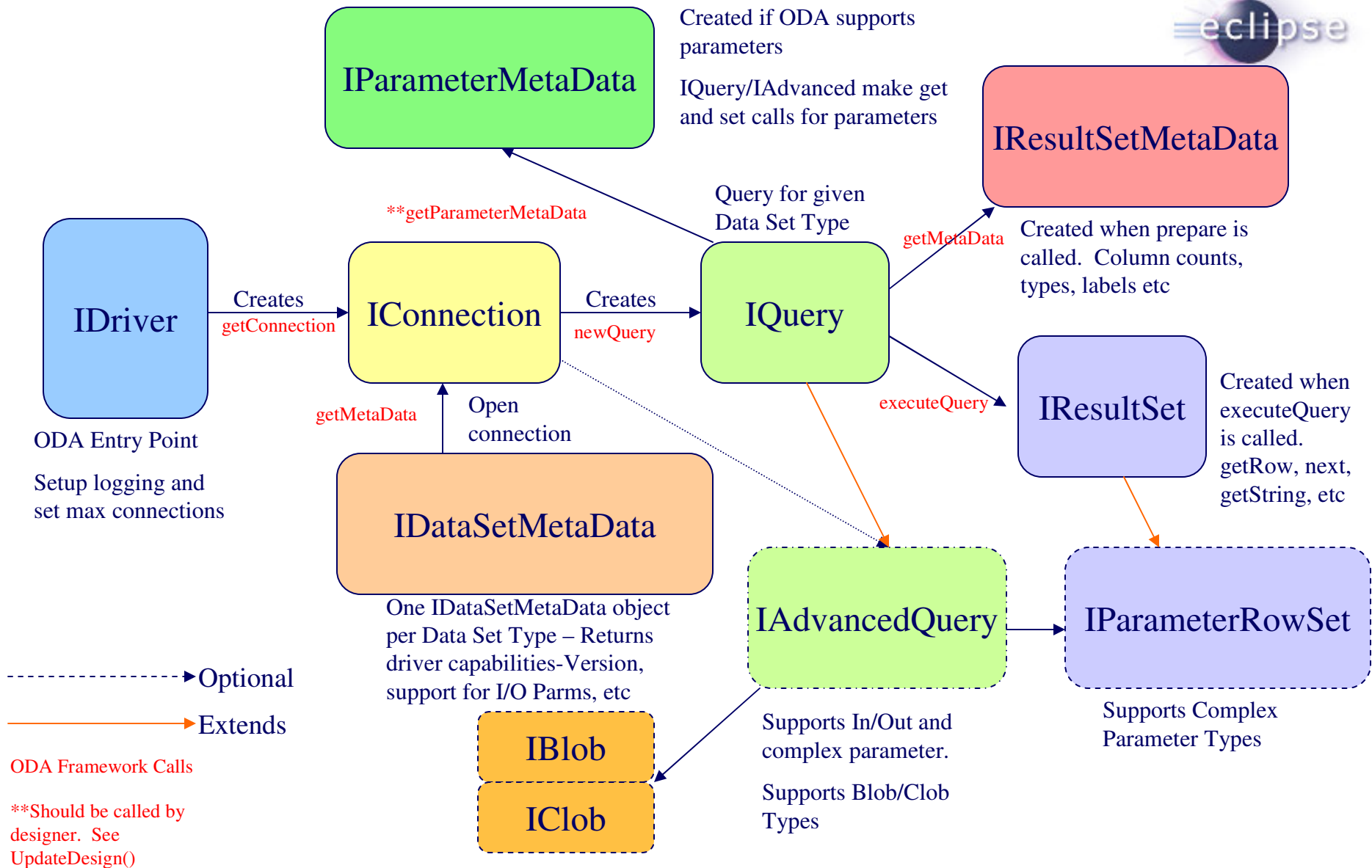
dataTypeMapping

Map consumer data type to ODA data types

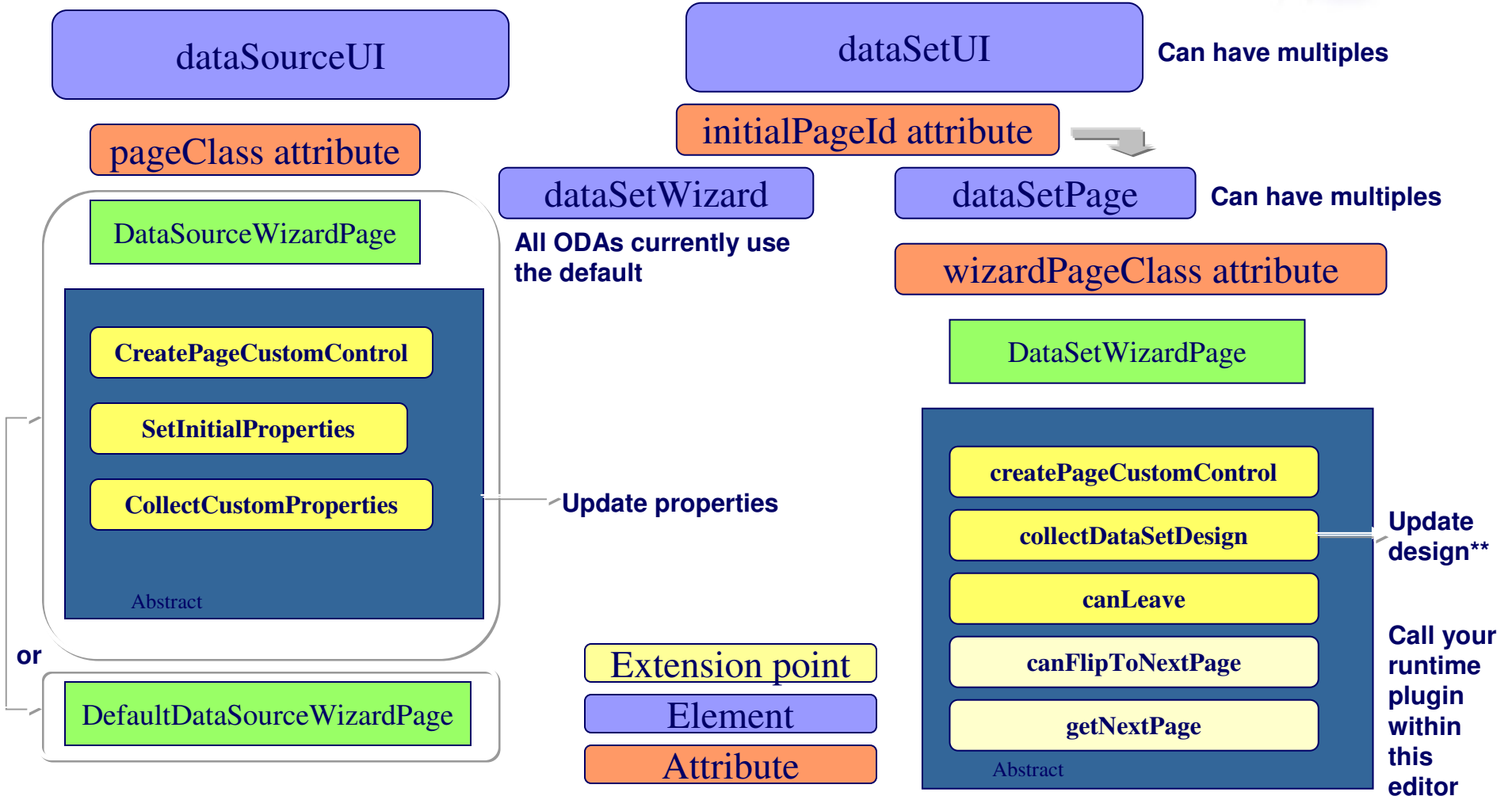


Entry point to the Driver. See next slide

- Extension point
- Element
- Attribute



org.eclipse.datatools.connectivity.oda.design.ui.dataSource



\*\*datatools.connectivity.oda.design.OdaDesignSession – ie DataSetDesign setPublicProperties to interface with emf model

# XML Data Set Example



```
<dataSetUI
  id="org.eclipse.datatools.enablement.oda.xml.dataSet"
  initialPageId="org.eclipse.datatools.connectivity.oda.xml.ui.dataset.ui1"
  supportsInParameters="false"
  supportsOutParameters="false">
  <dataSetWizard
class="org.eclipse.datatools.connectivity.oda.design.ui.wizards.DataSetWizard"/>
  <dataSetPage
    id="org.eclipse.datatools.connectivity.oda.xml.ui.dataset.ui1"

wizardPageClass="org.eclipse.datatools.enablement.oda.xml.ui.wizards.XmlDataSetSelectionPage"

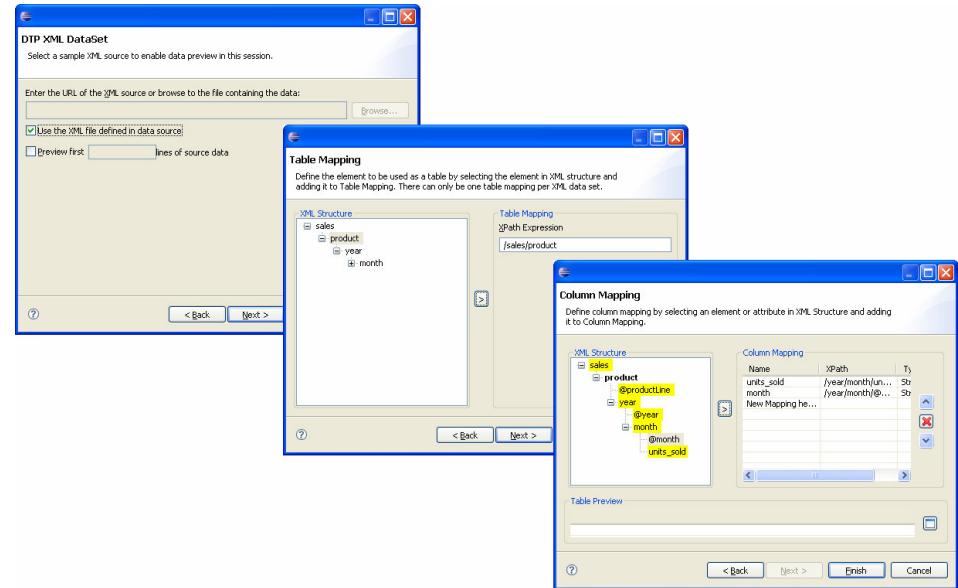
    path="/"
    displayName="%oda.xml.dataset"/>
  <dataSetPage
    id="org.eclipse.datatools.connectivity.oda.xml.ui.dataset.ui2"

wizardPageClass="org.eclipse.datatools.enablement.oda.xml.ui.wizards.XPathChoosePage"

    path="/"
    displayName="%oda.xml.tablemapping"/>
  <dataSetPage
    id="org.eclipse.datatools.connectivity.oda.xml.ui.dataset.ui3"

wizardPageClass="org.eclipse.datatools.enablement.oda.xml.ui.wizards.ColumnMappingPage"

    path="/"
    displayName="%oda.xml.columnmapping"/>
```





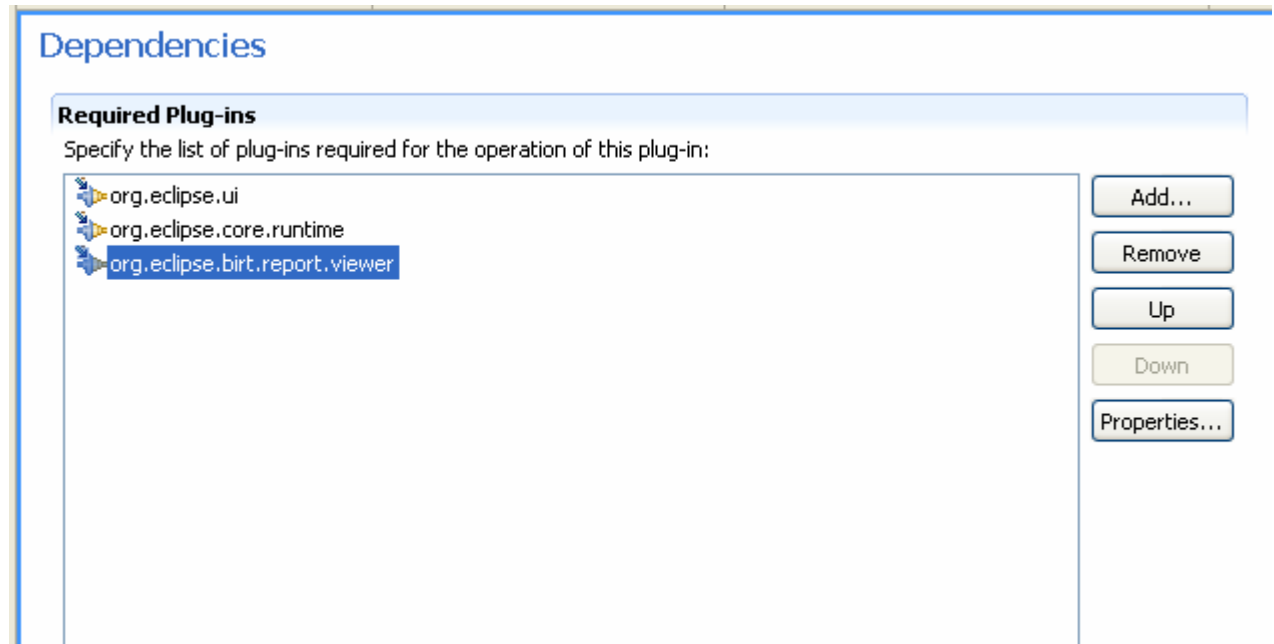


## Deploying BIRT to an RCP Application

# WebView Utility Class see RCPViewer Example



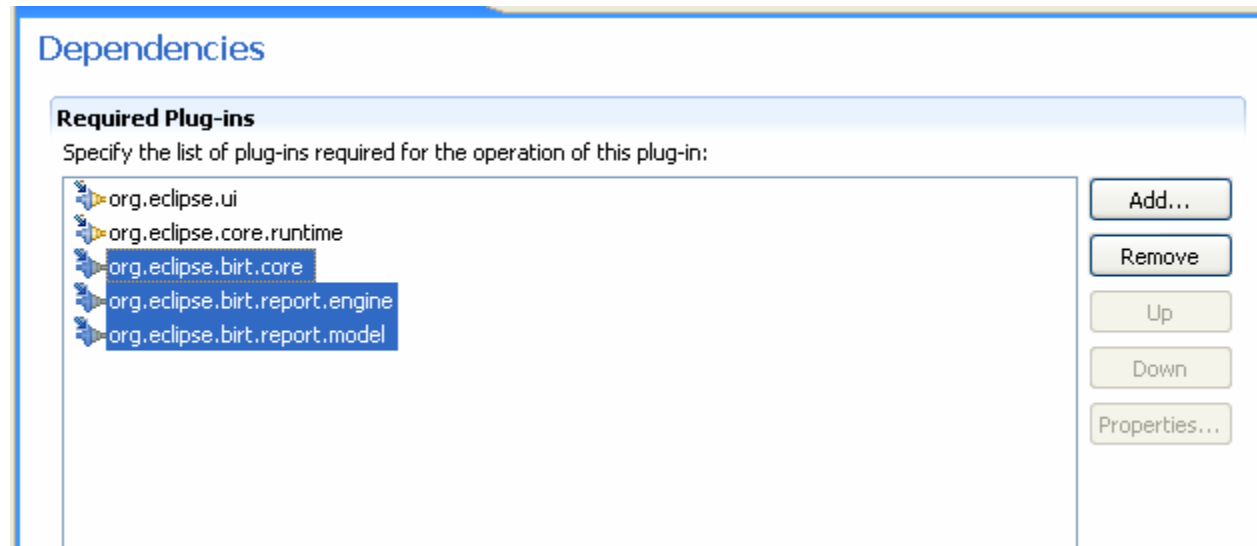
- `WebView.display()`
- See Example for Options.
- Used with external browser or SWT Browser Widget.





# Using the RE/DE API Plugins in an RCP application

- Do not set BIRT Home and use engines as normal.
- See RCP Engine Example.
- Uses SWT Browser Widget.





RCP Demo



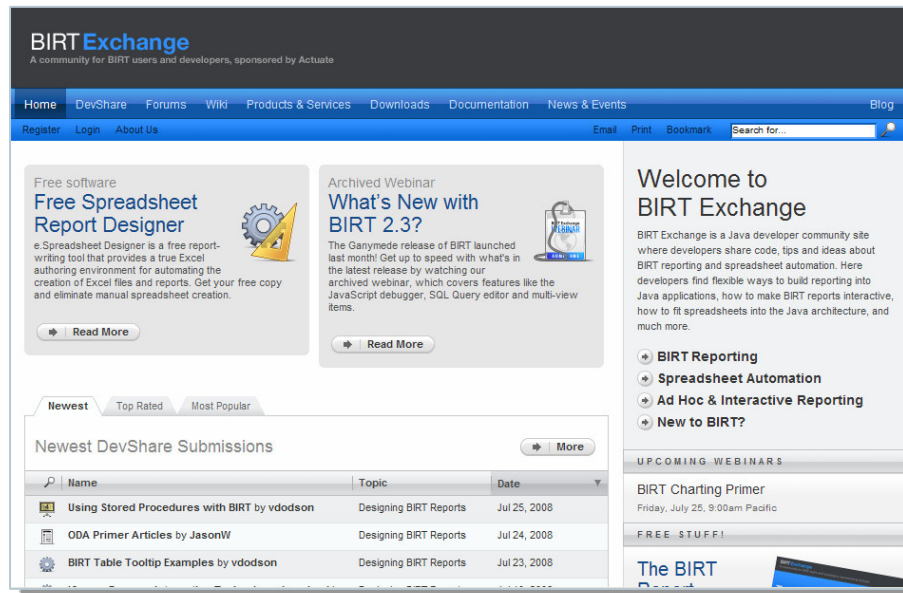
# Nurturing a Community: Evangelism

## BIRT Exchange Community Site



### Centralized knowledge hub for BIRT developers

- Access demos, tutorials, tips and techniques, documentation...
- Easy for users to contribute content, share knowledge
- Enables developers to be more productive and build applications faster



[www.birt-exchange.com](http://www.birt-exchange.com)

### Explore

- Search/sort
- Rate
- Comment

### Download

- Documentation
- Software
- Examples

### Contribute

- Report designs
- Code samples
- Technical tips

# Win a Lego Mindstorm NXT Robot!



- For your chance to win, just visit the Actuate BIRT stand and fill in a prize draw entry card or hand in your business card
- The draw will be held at the end of the day



# Discover What's Possible with Actuate BIRT Seminar

3<sup>rd</sup> March 2009, Central London

- Complimentary seminar
- Includes FREE BIRT training
- Designed for anyone with an interest in Application Reporting, Eclipse BIRT, Business Intelligence or Rich Internet Applications

Please ask us for more details or visit our website

<http://www.actuate.com/uk/info/Q109-BIRTSeminar-London.asp>

Don't forget to visit [www.birt-exchange.com](http://www.birt-exchange.com)